

REMARKS

Claims 1-26 are pending in the application after this amendment. The amendment of claims is not to be considered in any way an indication of applicants' position on the merits of the amended claims. In the following sections of the Amendment the rejections set forth by the Examiner in the November 12, 2004, Office action are addressed.

The specification has been amended to correct minor grammatical errors of which applicants have become aware. For example, the word "an" has been replaced with the word "a." Another example is that, spaces have been removed where they were inappropriately included. Please note that one corrected/replacement paragraph includes the footnote of the original application which is set forth at the bottom of the page. Claim 26 has been amended to correct a minor grammatical error of which applicants have become aware. Specifically, a space has been removed from between a word and a comma. It is submitted that these amendments should not be objectionable.

Applicants submit herewith a new Information Disclosure Statement (IDS) with two Benzler references. U.S. Patent No. 6,714,593 to Benzler et al. (the "Benzler reference"), which has been considered by the Examiner and upon which the Examiner bases his current rejections, specifically cites Benzler's German Patent Application No. DE 197 30 305 A1 ("Benzler's German reference"). Benzler's German reference is cited as the priority document for Benzler's PCT Patent Application No. PCT/DE98/01938 which was published as WO 99/04574 ("Benzler's PCT reference"). In preparing this response, applicants became aware of these references. Applicants respectfully request that the references set forth on the IDS be considered and acknowledged.

In the Office action, claims 1-2, 4, 6-7, and 9-26 were rejected under 35 USC §103 as obvious over the Benzler reference in view of U.S. Patent No. 6,249,318 to Girod et al. (the "Girod reference"). Claims 3, 5, and 8 were rejected under 35 USC §103 as obvious over the Benzler reference in view of the Girod reference and U.S. Patent

No. 5,767,907 to Pearlstein (the "Pearlstein reference"). These rejections are respectfully traversed, and detailed arguments are set forth below.

Incorporated herein (without repetition) are the specific recitation of the facts and the specific arguments found in previous papers. Instead, in this response, applicants will address the Examiner's response to applicants' previously submitted arguments.

First, the Examiner addressed the argument that the prima facie case of obviousness based on the combination of the references was not met because the elements (in this case, the different types of criteria) solve different problems. The Examiner states that the Benzler reference is also concerned with coding efficiency citing column 2, lines 45-50. This text directs the reader to Benzler's German reference. From the interpretation of the Abstract of Benzler's PCT reference, the discussion of Benzler's German reference (at column 1, line 58 - column 2, line 3 of the Benzler reference), the figures of all of the Benzler references, and applicants' understanding of the Benzler references, Benzler's "coding efficiency" is related to the fact that by increasing the quality of the prediction signal, a smaller error residual is transmitted. In other words, the better the prediction, the fewer bits required to transmit the error signal. Benzler does not take into account the cost in bits of actually encoding the motion vector. In other words, a given motion vector may minimize the minimum of the error, but it may be very costly to encode with bits, so it may not be the best choice from a coding standpoint. It should be noted, however, that Benzler does not appear concerned with the cost in bits of actually encoding the motion vector (coding efficiency). Perhaps Benzler is not concerned with this type of coding efficiency because Benzler transmits only the best motion vector of the macroblock, but not any of the intermediate motion vectors, from one location to another. As discussed in applicants' previously submitted responses, the Benzler method is concerned with the quality of images whereas the Girod reference is concerned with coding efficiencies (the cost in bits) that become significant with the computational demands of multiple reference frame selection and with transmission. Accordingly, the Benzler method uses

a criteria (minimum of the error criterion) that its inventors believed would produce the best image and the Girod reference uses a criteria (rate-distortion criteria) that its inventors believed would produce the best coding efficiencies. Since Benzler was not concerned with coding efficiencies (the cost in bits), it is unlikely that he would have replaced his minimum of the error criterion with the rate-distortion criteria set forth in the Girod reference. This is particularly true with the intermediate best motion vectors that are never transmitted to the decoder. Because the elements deal with different problems, applicants respectfully submit that the Examiner has not provided a suggestion to combine or modify the references and, therefore, has not met his burden of presenting the prima facie case of obviousness with respect to his 35 U.S.C. Section 103 rejection based on the combination of the Benzler reference and the Girod reference.

Second, applicants respectfully submit that the Examiner has not met his burden of presenting the prima facie case of obviousness with respect to his 35 U.S.C. Section 103 rejection based on the combination of the Benzler reference and the Girod reference because he has provided no suggestion to combine or modify the references. Applicants maintain that there is no suggestion or motivation in either the Benzler reference or the Girod reference to combine the references without using a high level of skill, the present claims, and/or hindsight. The mere fact that the references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). There is no teaching in either reference that such a combination is desirable. Further, although a prior art device "may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so." *In re Fritch*, 972 F.2d at 682, 16 USPQ2d at 1432.) The Examiner's response to this argument is that *In re McLaughlin* 443 F.2d 1392, 1395, 170 USPQ 209, 212 (CCPA 1971) states that "any judgment on obviousness is in a sense necessarily a reconstruction based on hindsight reasoning, but so long as it takes into account only knowledge which was within the level of

ordinary skill in the art at the time the claimed invention was made and does not include knowledge gleaned only from applicant's disclosure, such a reconstruction is proper." The Examiner, however, did not provide any suggestion or motivation from either the Benzler reference or the Girod reference that a combination of the references is desirable or a reason why one skilled in the art would have found such a combination desirable. Without such a suggestion, the Examiner has not met his burden of presenting the prima facie case of obviousness with respect to his 35 U.S.C. Section 103 rejection.

Third, applicants maintain that the proposed modification cannot change the principle of operation of a reference. One principle of operation of the Benzler reference is that it uses distortion to find a motion vector to compensate a reference frame to obtain an image as close to the current frame as possible in terms of some distortion metric. The Girod reference, on the other hand, uses rate-distortion. Rate-distortion is a joint optimization of the distortion and the cost of transmitting coding information, rate. Distortion and rate-distortion are not equivalent as they are used for fundamentally different purposes and produce fundamentally different results. Using rate-distortion in the Benzler reference inherently changes Benzler's principle of operation. The Examiner suggests that because the Benzler reference is directed to an MPEG encoder at column 4, lines 55-65, at least for the B-frame coding, it would need to rely on two anchor or reference frames, and thus would not always be restricted to a single reference frame. In B-frame (Bidirectional Frame) coding, frames are coded using the data from the past as well as future I/P frames. A combination of the past and future frames is used, but no selection is made between the past and future frames. The Girod reference is directed to a video coding/decoding arrangement and method therefore that selects the best frame of multiple reference frames. Whereas B-frame coding uses both a past and future anchor frame, the Girod reference selects a single, best reference frame from multiple reference frames. The Girod rate-distortion criteria could not be directly substituted into the Benzler method without substantially and significantly changing the structure of the Benzler codec in that the Girod rate-distortion

criteria is critically dependent on multiple reference frames from which one frame is selected. Substituting the Girod rate-distortion criteria for the Benzler minimum of the error criterion would produce an efficiently coded motion vector, not the Benzler best motion vector to produce the best quality image.

Fourth, the proposed modification cannot render the prior art unsatisfactory for its intended purpose (MPEP 2143.01). Since the intended purpose of the Benzler reference is to find a motion vector to compensate a reference frame to obtain an image as close to the current frame as you can in terms of some distortion metric, modifying it by using rate-distortion would defeat its intended purpose. Using rate-distortion would prevent the Benzler reference from finding the reference frame that would obtain an image as close to the current frame as you can in terms of some distortion metric.

In independent claims 1, 9, 16, 20, 21, and 23, rate-distortion criteria is used. The known references taken singly or in combination, do not teach or suggest the subject matter of the amended claim and, therefore, this claim should be allowable. The claims dependent on these independent claims are allowable for the same reasons as well as for the individual limitations contained therein and applicants respectfully reserve the right to present arguments thereto in future communications.

Reconsideration of the claims is respectfully requested in view of the above amendments and remarks, and early notice of allowance thereof is earnestly solicited.

A Petition for Extension of Time for One Month is enclosed herewith.

Application No. 09/615,791
Amendment dated March 14, 2005
Reply to Office action of November 12, 2004

Please charge Deposit Account No. 50-2115 for any additional fees which may be required.

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "Karen Oster", is written over a horizontal line.

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